D1.7
Training courses and interactive solutions 1.0 version 1.0

PUBLIC

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This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No. 951813.

Project acronym	Project title	Grant agreement No.
Better Factory	Grow your manufacturing business	951813

Deliverable No.	Deliverable title	Version
D1.7	Training courses and interactive solutions 1.0	1.0

Type	Dissemination level	Due date
DEMONSTRATOR	PUBLIC	31.1.2023

Lead beneficiary	WP No.
GLUON	1

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VTT archive code	Lead beneficiary archive code
VTT-R-01386-20	

Abstract

This document describes the development and results of training tools and courses developed until M28 of the project. It is is divided in 3 parts: development of courses and training materials for KTE members (1), defining SME and KTE needs in regard to the trainings, APPS, RAMP Platform and VR Lab (2), and the conceptualization of a VR Lab in which youngsters and students prototype VR and AR solutions for SMEs (3).

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Acknowledgement

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EXECUTIVE SUMMARY

An area that affects the added value of EU industry towards the digitisation of the wider manufacturing community is the availability of digital skills. The skill shortage could slow down the growth trend in ICT in Europe. The lack of access to digital skills has been regarded as the third most important reason for SMEs not to integrate digital technologies into their value chains. New skills and disciplines are needed for the automation of the production of new and personalised products as also presented in World Manufacturing Report 2019. The objective of Work package 1.4 'Skill Development' is to invest in a continuous skill upgrade by building a training repository with specific modules for digital technology addressed in the KTEs.

Deliverable 1.7 'Training courses and interactive solutions 1.0' describes the development and results of training tools and courses developed until M28 of the project. It is is divided in 3 parts:

- **Development of courses and training materials for KTE members**: video materials, downloadable written documentation and GitHub links
- **Defining SME and KTE needs**: in order to define the SME and KTE Needs in regard to the trainings, APPS, RAMP Platform and VR Lab, a **questionnaire** and an interactive **Focus Group Discussion** was developed and executed.
- **Conceptualization of a VR Lab:** development and realization of a 5-day long workshop in which youngsters and students prototype VR and AR solutions for SMEs.

1 Courses and trainings

Different **courses and trainings (courses and training sessions)** were developed and are currently offered on the Better Factory website Training Catalogue: https://betterfactory.eu/trainings/. In the future, these contents will be added to RAMP platform.

The first section of the training platform offers content that allows people to better understand the **Better Factory project**, the **RAMP Marketplace** and **APPS**.

In the second section the necessary training contents are provided to support the adoption of skills for **deploying the** Better Factory technologies (APPS) and effectively implementing cyber-physical systems and collaborative robotic technologies to maximize agility in production for the personalization of products through agile manufacturing. The division of the APPS into 4 main packages is also applied on the web page:

(1) Logistics automation and optimization
(2) Production reconfiguration
(3) Cognitive HRI
(4) Resource optimization

According to the GA objectives O4.1 and O4.2, the number of courses in skills repository is nine (1 per service in APPS, 1 for APPS) and the number of training sessions will be at least three per KTE's round. The objective is to do 6.

Name	Description	KPIs
Nº of courses in skills repository (1.1)	Extracted documents / videos from the partners work and training sessions (webinars) with SMEs selected to participate in the creation of KTEs	9 (1 per service in APPS and 1 for APPS)
Nº of training sessions (1.2)	The training sessions organized will be webinars aiming to cover brand ranges of topics useful for RAMP users and other platform stakeholders	6 webinars – each 3 hour long (At least 3 per KTEs round)
Nº of new skills covered by courses added in RAMP (1.3)	Access to two skills on top of the already developed DIH2 and L4MS projects. This will increase manufacturing workers awareness on new technologies	2

1.1 Courses in skills repository

1.1.1 Contents until M28

The training catalogue https://betterfactory.eu/trainings/ includes:

- **video materials**: recorded webinars, trainings on the potential and use of APPS and complementary videos to the documentation. They are represented with (23 so far).
- **downloadable written documentation**: user guides and presentations used in videos. They are represented with (18 so far).
- **GitHub links** that redirect to the repository where one can find the module and the README with all the information for its installation and use. As this software can be evolved, it is the most efficient way to create and maintain user manuals. They are represented with (8 so far).

The mapping of content in our training catalogue is summarised in the following table.

Table 1. Training content mapping at M28

Package / Section	Components	Videos	Documentation
Onboarding to Better Factory	-	What is Better Factory?	-
		What is the Expression of Interest?	
		How to apply to our Open Call?	
Onboarding on RAMP	-	What is RAMP?	-
		How to get started with RAMP as KTE?	-
		How to create a tender on RAMP?	Guide on making a tender in RAMP
		RAMP Docker Registry	-
Introduction to APPS	-	Technology solutions offered by Better Factory: APPS	Technology solutions offered by Better Factory: APPS
Logistics and automation library	Logistics Library	Logistics Library Workshop	Documentation OPIL
		Introduction	
		Installation	
		Modules	
	Person detection & Tracking	Tracking of workers in shared space	Person Detection & Tracking Manual
		Person detection tracking	
	Agent Optimization	Agent Optimization	https://github.com/ramp-eu/Agent_Optimisation_Service#readme
	Temporal Heatmap of Human Occupancy	Temporal Heat Maps	https://github.com/ramp-eu/THMHO_heatmap_generator#readme Temporal Heatmap of Human Occupancy User Manual
	Real-Time Locating System	Positional Data Acquisition	-
	Material Flow	-	-
Production reconfiguration	Advanced Plant Modelling (APM) & 3D Digital Twin	-	Create Physical Area
		-	Implant objects on the physical area
		-	Create Physical Area with Map
		-	Add a new rack to the Catalogue
		-	Add a new rack to the Catalogue with STEP
		-	Add a new equipment to the catalogue
		-	Add a new workstation to the catalogue
		-	Add a new production line to the catalogue
		Complementary video of the documentation	-
		KTEs Webinar (Advanced Plant Modeling)	-
		-	User Manual of the Digital Twin Designer
	Manufacturing Process System Management & Camunda	-	The Camunda Platform Manual
		Manufacturing Process Management System	https://github.com/ramp-eu/Manufacturing_Process_Management_System/blob/master/README.md
Cognitive HRI	Fatigue Monitoring System	-	https://github.com/isteps-sps-lab/bf-fams
	Intervention Manager	-	https://isteps-sps-lab.github.io/bf-im/index.html
	Pose Recognition and Correction	-	CognitiveHRI-PRaC Manual
Resource Optimization	Process Optimization	Process Optimization	Process Optimization Manual
	Business Process Optimization	-	Business Process Optimization Manual
	Apache Superset app	-	-
Non-tech Trainings	Business Training	KTEs Business Kick-Off Webinar	Webinar presentation

1.1.2 Structure of the Training catalogue

The training catalogue has an iteratively evolved structure of contents, with a user-friendly and intuitive design. It is divided into main sections: Onboarding to the project Better Factory (1), Onboarding on RAMP (2), Introduction to APPS (3), APPS #1-4 (4-7) and Non-tech trainings (8). Each section includes an introduction presenting the objectives and an overview of subsections, also having their own introduction. Finally, the contents (videos, documents and GitHubs) are presented in two columns.

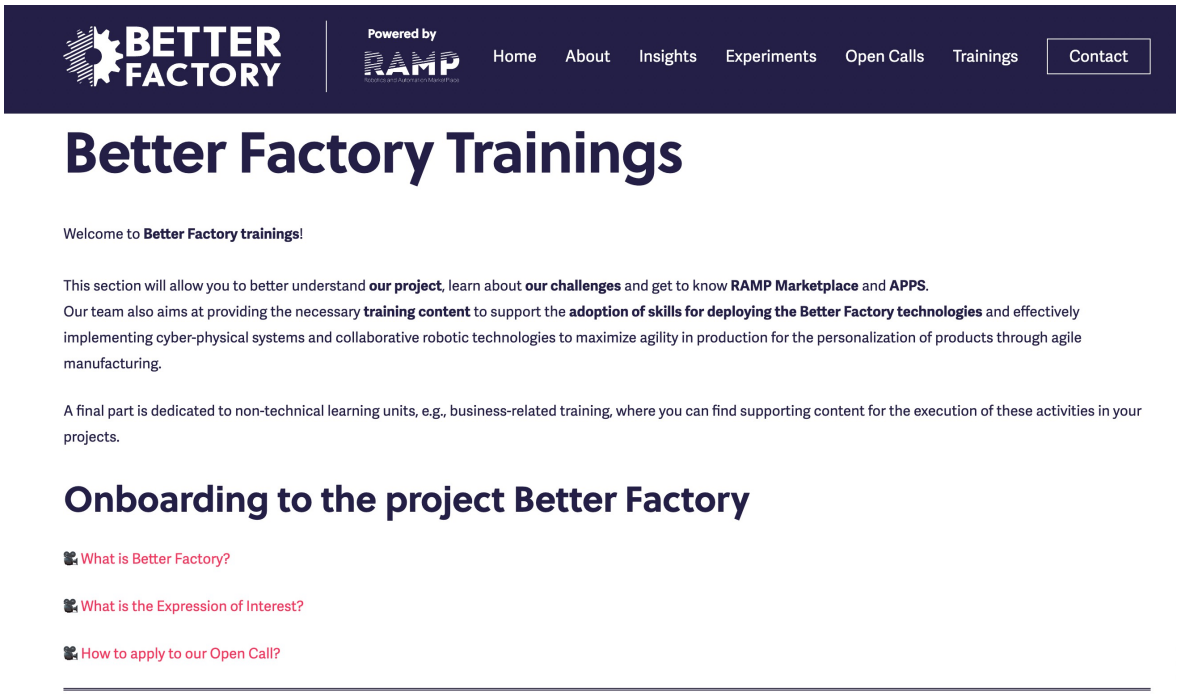


Figure 1. https://betterfactory.eu/trainings/ _ Screenshot 1

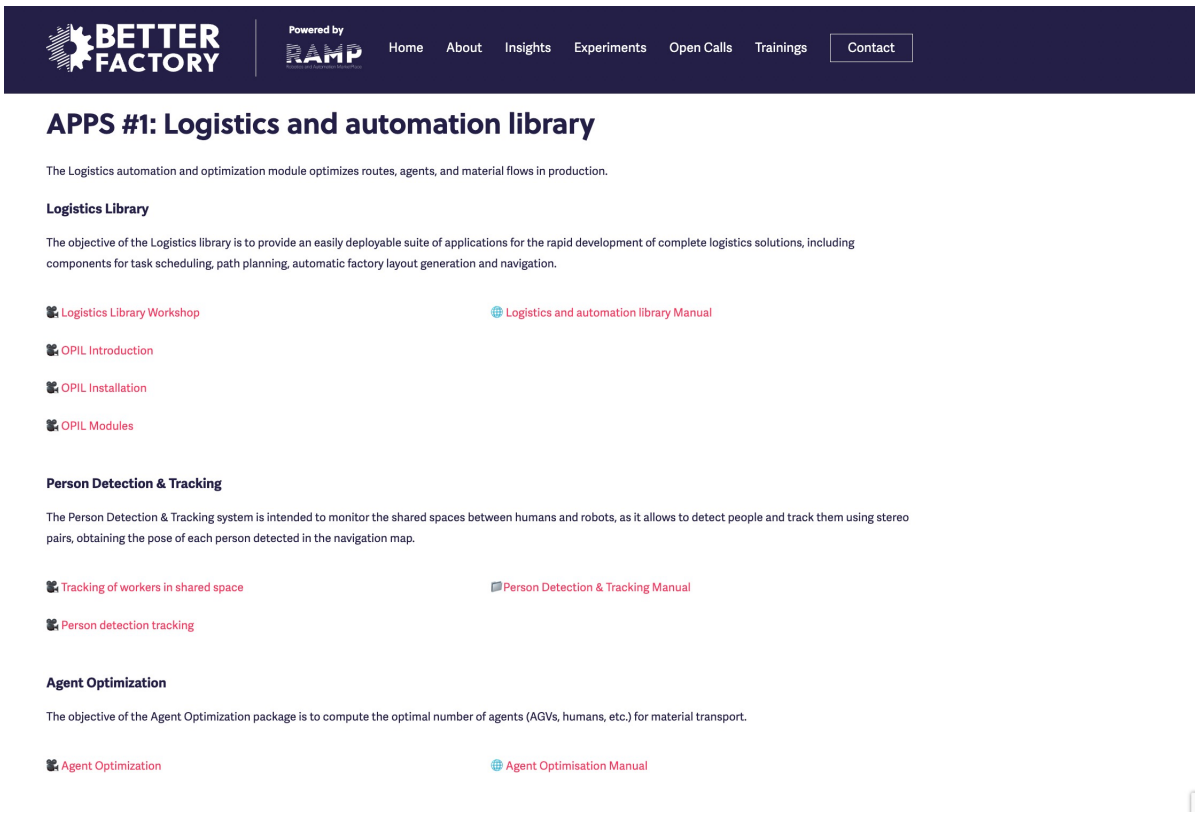


Figure 2. https://betterfactory.eu/trainings/ _ Screenshot 2

1.2 Training sessions

In total 23 Training sessions were executed, with or without live audience. They were uploaded as video materials on the training catalogue.

In the period from November 2021 until January 2023 five live webinars were scheduled for KTE members:

- How to get started with **RAMP** as a KTE?
- Advanced Plant Modelling (APM) by INESC TEC - MPMS module by European Dynamics (**Production reconfiguration APPS)**
- Aiya (**Logistics automation and automation APP) –** by TopDataScience
- **Logistics automation and automation Library and APPS -** by Holonix
- **KTEs Business Kick-Off webinar** – by Hermia Business Development and Inova+

1.2.1 Better Factory Training Webinar 1

Title: How to get started with RAMP as a KTE?
Date: 3-11-2021
Time: 15-16u30 CET
Location: Zoom
Lead by: Marta Portales (MW Capital), Marta Coto (Innova) and Panos Bouklis (European Dynamics)
Participants: KTE representatives (35 participants)
Webinar link: https://betterfactory.eu/trainings/ &
https://www.youtube.com/watch?v=vHHVACmJnw4&feature=youtu.be

The webinar was introduced by Marta Portales, specifying the role of MWCapital and GLUON and presenting the webinars and workshops to come.

Participants were then invited to take part in a survey (questionnaire) to shape the most accurate training for their employees to work with RAMP, through this link: https://form.typeform.com/to/Y4dSgORe?typeform-source=mwcapital.typeform.com.

Next, Panos Bouklis was introduced by Marta Coto. He was then going into detail about how to work on the RAMP platform during the Expirement, more specifically:

- how **to make a login, company profile, add participants, change their roles and other details**;
- how to **set up new projects**, as in the experiment 3 projects will have to be designed (Automation (technology provider - manufacture), Product design (artist - factory) and Consultancy);
- how to **share files and tools** (Factory Dashboard, Digital Twin and Online CAD viewer);
- participants were invited to scroll trough **the Software Library**; and
- finally there was a reference to the use of the **helpdesk and contact form**.

The webinar was concluded with a feedback moment.

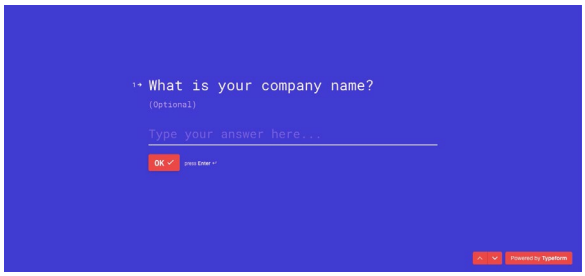


Figure 3. Survey for SMEs

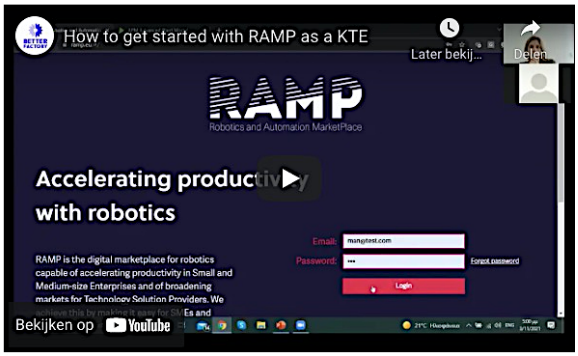


Figure 4. How to get started with RAMP as a KTE?

1.2.2 Better Factory Training Webinar 2

Title: Advanced Plant Modelling (APM) by INESC TEC - MPMS module by European Dynamics

Date: 16-11-2021
Time: 15-16u30 CET
Location: Zoom
Lead by: Marta Portales (MW Capital), Marta Coto (Innova), César Toscano (INESC TEC) and Panos Bouklis (European Dynamics)
Participants: KTE representatives (32 participants)
Webinar link: https://betterfactory.eu/trainings/

This webinar was presenting a training about two APPS modules:

- Advanced Plant Modelling (APM)
- Monitoring Project Management System (MPMS)

César Toscano (INESC TEC) gave a workshop on APM, a tool to visualize manufacturing through 3D models and to create a Digital Twin of the manifacturer. Participants learned how to 'create a physical area' on the platform, 'implant objects on the physical area' and 'add new elements to the catalogue'.

Developer Panos Bouklis (European Dynamics) gave a training about MPMS, a tool for designing and managing manufacturing workflows. He went more into detail on how the tool can model the collaboration between humans, how tasks can be assigned, and how errors can be fixed.

Participants were referred to the RAMP platform for documentation about the APPS and were invited to take contact in case of difficulties.

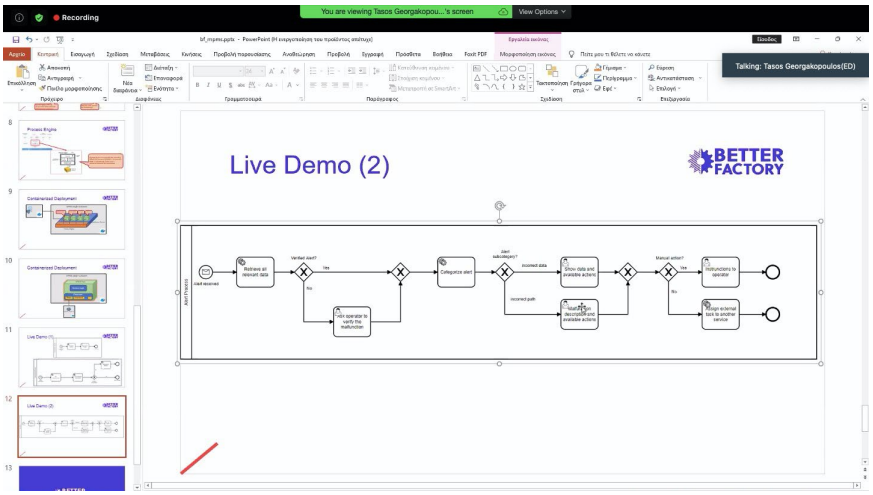


Figure 5. Training on the use of APM and MPMS

1.2.3 Better Factory Training Webinar 3

Title: Aiya by TopDataScience
Date: 25-11-2021
Time: 15-16u CET
Location: Zoom
Lead by: Marta Portales (MWCapital) and Kai Lehtinen (Top Data Science)
Participants: KTE representatives (22 participants)
Webinar link: https://betterfactory.eu/trainings/ &
https://www.youtube.com/watch?v=cjCaJyiDYhI&feature=youtu.be

During this webinar the **Process Optimization tool Aiya** developed **by enterprise Top Data Science**, was explained.

After a short introduction, the concept and approach of **process optimization** was clarified. **Aiya** is a state-of-the-art AI solution that is used for optimizing and steering industrial processes, based on historical and real-time data. Aiya models the process performance and predicts its output with high accuracy. It provides significant benefits for businesses (cost savings, quality targets and improved production sustainability), organizations and personnel (in the operation of production processes).

Next, the **technical architecture** of the tool in the context of RAMP was clarified.

Finally, the team demonstrated how end-use applications work with Process Optimization through a **RESTful API**.

The training was short and to the point so that there was enough time for the **QA round.** Participants were able to ask questions about topics such as missing data, product quality optimization and how to deploy the API.

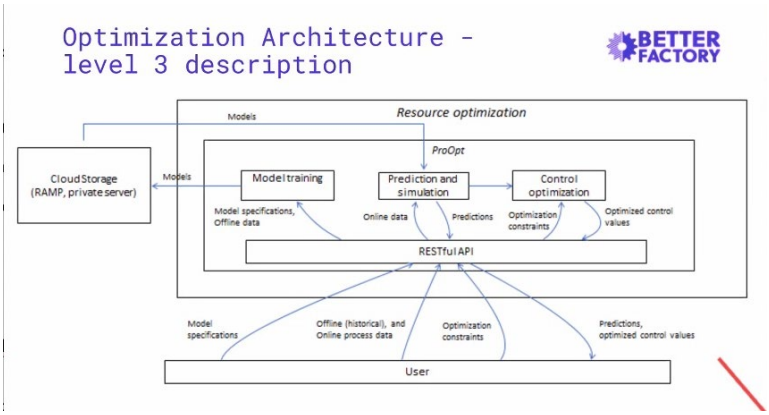


Figure 6. Optimization Architecture

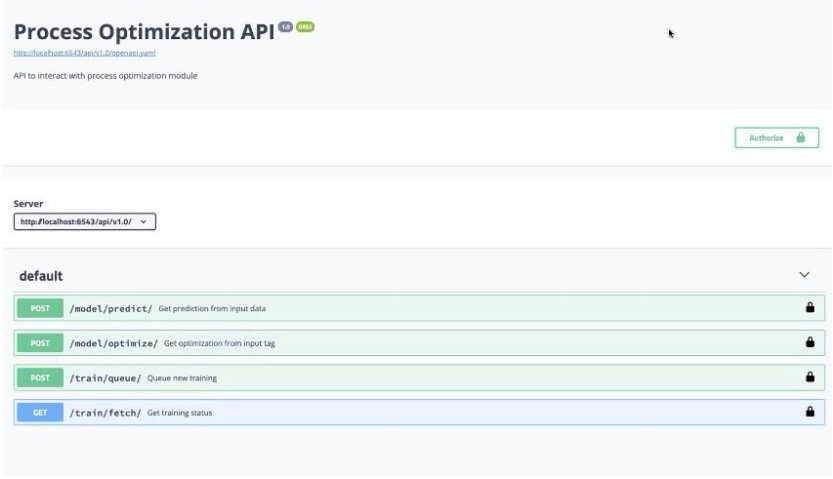


Figure 7. Process Optimization API

1.2.4 Better Factory Training Webinar 4

Title: APPS by Holonix - Logistics Automation Library

Date: 14-12-2021
Time: 15-16u30 ET
Location: Zoom
Lead by: Marta Portales, Frantisek Duchon (NCR), Ramez Awad (IPA fraunhofer) and Diego Perez (AIMEN)
Participants: KTE representatives (29 participants)

Webinar link: https://betterfactory.eu/trainings/ & https://www.youtube.com/watch?v=Z2k_CMlSg1U

The first part of the webinar 'Logistic optimization' was clarified in the context of the APPS by Frantisek Duchon, NCR (Stuba, Slovakia). Logistic optimization is the module APPS aiming to optimize the routes, agents and material flows in production. During **I4MS project** the **Optimization Logistics Library (OPIL),** which offers the basic infrasctructure of the module, was developed. OPIL is being used for optimizing the factory and enabling continuous adaptation and reconfiguration of the logistic system with low effort; by inserting real data in a model the expected output is given. The objective of OPIL is to provide an easy deployable suite of APPS for rapid development of complete logistics solutions.

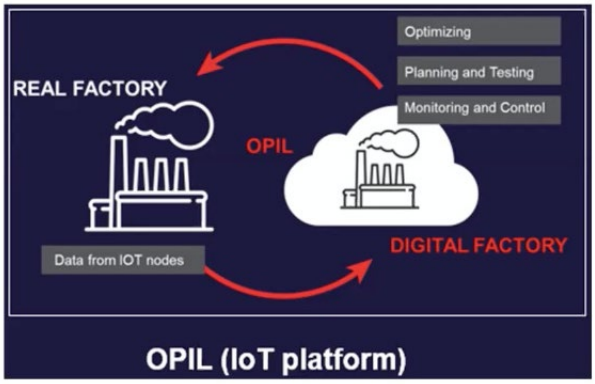


Figure 8. OPIL

Synergistically building upon previous project results, within the Better Factory project different technologies are being/will be developed by NCR (Slovaka), Infotech (Slovakia), FHG (Germany) and AIMEN (Spain):

The technologies **Agent Optimization, Real time locating system** and **Material flow** were described by Frantisek Duchon, NCR.

The objective of the **Agent Optimization** package is to compute the optimal number of agents (AGVs, humans, etc.) for material transport. This happens by using input info such as distance, flow rate and agent parameterss (speed, capacity). Finally, a **Real-Time Locating System** for Positional Data Acquisition was developed. **Positional data acquisition** is necessary for optimizing the work; a specialized infrastructure of beacons and tags is available to achieve these goals.

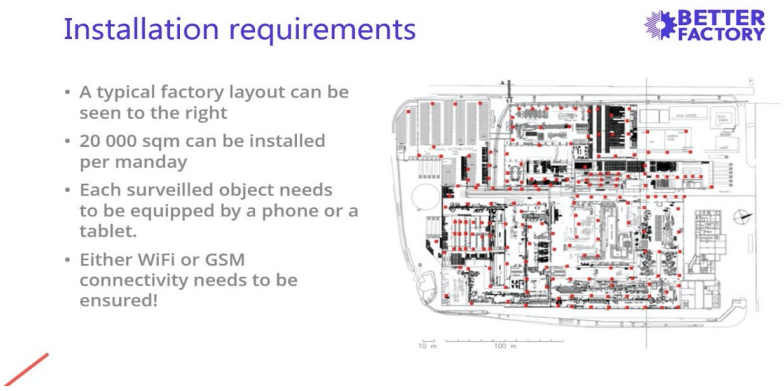


Figure 9. Installation requirements

Ramez Awad (IPA Fraunhofer) was going into detail about the technology **Temporal Heat Maps**. For development of temporal heat maps, Human Occupancy was developed to show the rate of human occupancy for each square meter, and each hour of each workday. Using stationary lidars (sensing technology) and AGVs, data about foot traffic is gathered during various working hours. Data is aggregated in heat maps indicating the probability that a hallway will be occupied. Companies can deploy the system in their factories, for taking data for a couple of months and making a heat map.

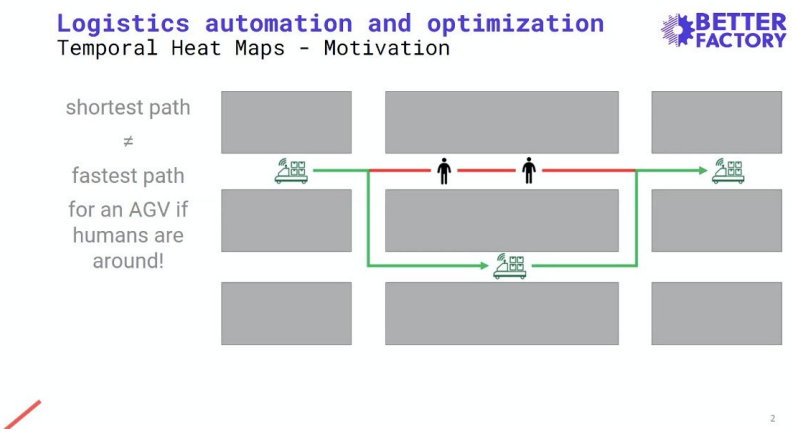


Figure 10. Temporal Heat Maps

Finally, Diego Perez (AIMEN) was going into detail about the APP **Person detection and tracking**. The aim of this tool is to better integrate the AGCs in a shared space. It focuses on tracking of workers in shared space and on Person detection and tracking.

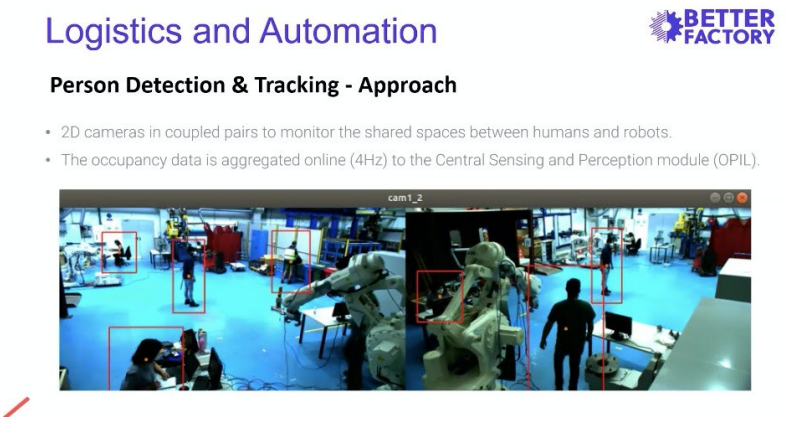


Figure 11. Person Detection and Tracking

1.2.5 Business Kick-Off Webinar 5

Title: Business Kick-Off Webinar 5 – by Hermia Business Development and INOVA+
Date: 8-3-2022
Time: 11u CET
Location: Zoom
Lead by: Petri Purmonen (Hermia Business Development, FI), Marco Duarte (INOVA+) and Tânia Moreira (INOVA+)
Participants: KTE representatives (35 participants)
Webinar link: https://www.youtube.com/watch?v=HsD1GZ32eYY

Part 1: Business training for SMEs and tech suppliers

Hermia Business Development (FI) is mentoring the SMEs and tech suppliers of all the KTEs and is responsible for the scale-up tasks of the KTEs. During the first part of the Business Kick-off webinar, Petri Purmonen gave a better insight in the business-related tasks of the KTEs. The training included an overview of the KTE business scale-up tasks, the business mentoring plan, as well as a presentation of exercises/tools to support the preparation of the business plan for Tech Suppliers and SMEs.

Part 2: Business training for artists

INOVA+ is mainly mentoring and supporting the artists within the KTEs. In the second part of this webinar, Marco Duarte and Tânia Moreira presented the business part of the project more specifically to the artists. They presented two exercises that will be performed throughout the KTEs regarding the business activities.

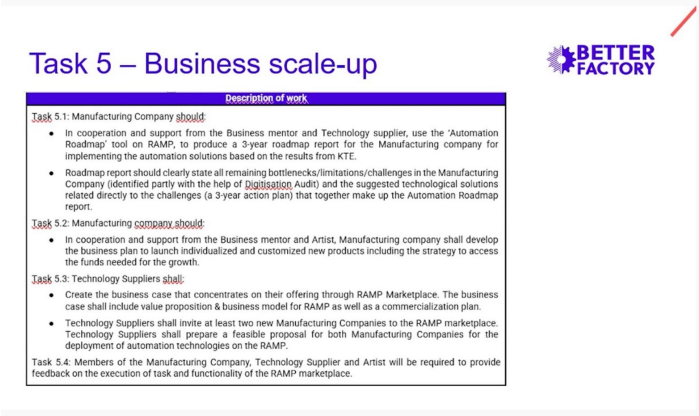


Figure 12. Business training for SMEs and Tech Suppliers

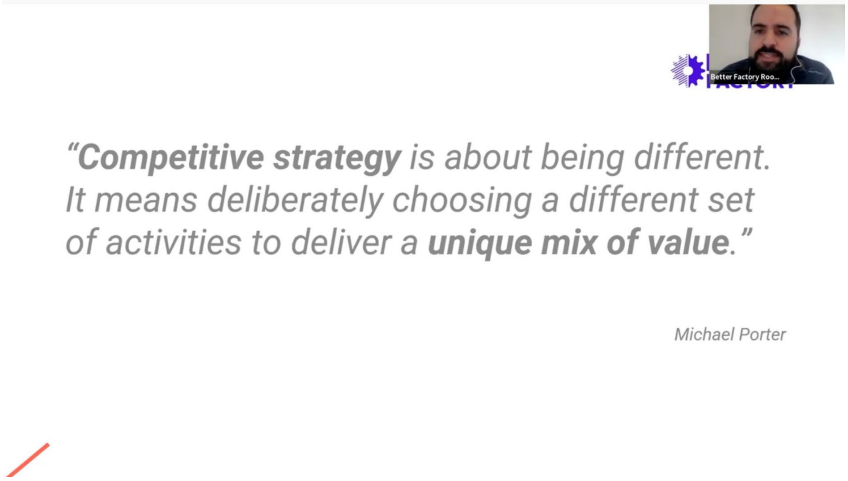


Figure 13. Business training for artists

1.3 New skills covered by courses added in RAMP

The skills development strategy is to build all the contents and create the Better Factory Training Catalogue available in the project's website. Section 1.2 presented the contents offered so far. After the end of the project, RAMP platform will be the sustainability tool where all the training materials will be offered, updated and continuously improved.

2 Defining SME and KTE Needs

In order to define the SME and KTE Needs in regard to the trainings, APPS and RAMP Platform the KTE members were invited to take part in a **survey/questionnaire** and an interactive **Focus Group Discussion**. Based on the results an analysis and actions for the future were defined.

2.1 Questionnaire

The questionnaire was developed by MWCapital and GLUON with the online tool TypeForm. The 23rd of November 2021, during the montly consortium meeting, Better Factory partners were asked to give feedback on the questions already formulated.

The final questionnaire was shared in December and finally completed by 7 persons.

The questions are summarized below, the results are attached in appendix I

1. **What is the average level of education of your employees?**
2. **What is the average age range of the employees involved in Better Factory?**
3. **What is the level of experience of your employees?**
4. **Do you have a life-long training program for your employees?**
5. **Are your employees following training courses?**
6. **Do you believe that VR can result in:**
   - Better trainings
   - More personalized products
   - Better work atmosphere
   - Higher profits
   - Others
   - Reduced working hours
   - Safety
7. **VR can be useful for training SME employees in**
   - any new technology
   - simulating safety scenarios
8. **Do you believe that the impact of VR trainings on your SME might be positive on next points?**
   - Through simulating real-time movements VR trainings decrease the cost and risk of physical implementation.
   - VR trainings create a risk free and injury free environment.
   - VR trainings reduce the number of unsolved training errors and thereby their potential undesired consequences.

2.2 Focus group discussion for SME and 1st round of KTEs

Title: Focus group discussion on skills, trainings and VR
Date: 11-01-2022
Time: 15-16u30 ET
Location: Zoom
Participants: Marta Portales, Paula Cervera, Elke Verhaeghe and the representatives of the KTEs
MURAL link:
https://app.mural.co/t/i4ms7994/m/i4ms7994/1641544276041/86ea4c2705004351f1f4f59f08cd6d919b5dcade?sender=8c12fd80-c50f-4be6-b67f-3b19fa88a81e

Program:

The Focus group discussion was built up out of 5 board sessions.

1) Profile Meeting
Getting to know each other (KTEs, missions, …)

In the first board participants were presenting themselves and identifying the benefits and core promises of the technology implementation.

2) Skills needs – Implementation
What are the training needs of each KTE during implementation of the project?

The aim of this board was to understand the implementation methodology and steps the KTE members will follow as well as the skill needs to perform this implementation.

3) Skills needs – Information and Data Awareness
How are data collected, stored and analyzed? What is the level of cybersecurity knowledge and awareness?

During this session we got to understand how SMEs currently collect, store and analyze data, as well as know more about their cybersecurity knowledge and awareness. This allows us to have an idea of the training needs on these topics.

4) Skills needs – VR Experience
What is the overall experience and expectation of VR?

Mission was to have a basic understanding of the SMEs' previous experience in VR use. This allows us to have an idea of the training needs on this topic.

5) Skills needs – Workers' trainings
What is the level of education and experience of the SME's employees? Which trainings have been done and which skills are required?

The aim was to understand what is the level of education and previous experience of employees, previous trainings and the skills required to work in their company. This allows us to build the most appropiate training.

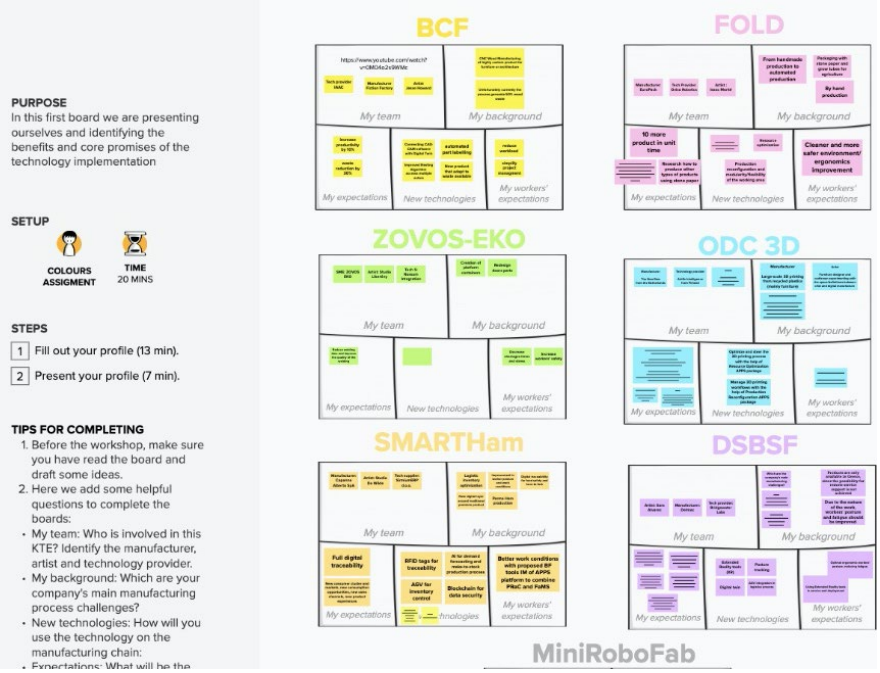


Figure 14. Focus Group meeting

2.3 Analysis results of the questionnaires (survey) and focus group discussion

Based on the results of questionnaires and a focus group meeting with 5 KTEs (SMEs, Tech providers and artists) an analysis was done of the KTE Needs regarding to the trainings, RAMP Platform and APPS. This resulted in a draft plan with key ideas.

BACKGROUND ABOUT THE SME EMPLOYEES INVOLVED IN BETTER FACTORY:

- Highly educated (Master, PhD, …)
- Age range 25-34
- 50% of the SMEs have a life-long training program for employees
- 85% of the employees are following training courses

TRAININGS

- Additional trainings and documentation regarding to AGC, ROS integration, DB setup, iOT connections/upload, Digital Twin, Cognitive HRI, the platform Camunda and GRAPHANA, an analytics and interactive visualisation tool.
- A marketing training during product development

RAMP Platform

- Improvement of the RAMP Platform through customisation of the ramp.eu UX interface and debugging which should result in a more user-friendly environment
- Security about data privacy on the Platform's external cloud
- Keeping track of bugs on the RAMP Platform, with a possibility to recommend improvements and report issue and get an update about the timeline of implementation
- Possibility to develop the Tech Provider's solution remotely regardless of the distance between the manufacturer and the technology provider.

APPS

- Live support on the implementation and integration of the APPS, e.g.: through tutorials.
- Clarity about how the resource optimization APPS can be applied for the manufacturer's use case.

VIRTUAL REALITY

Based on the results of the questionnaires and focus group we can conclude there is a general belief that VR/AR can result in

- better trainings (in new technologies);
- more personalized products;
- better work atmosphere; and
- a decrease of cost and risk of physical implementation through simulating real-time movements.

2.4 Next actions for improving the RAMP platform and trainings

Based on the result analysis of the questionnaire and focus group meeting, a mapping of trainings and documentation was done. Next, an action plan was developed of which the main goal is to fill the gaps in regard to the next KTE round.

At M28, the partners have advanced on the abovementioned actions, and the contents offered so far are described at section 1.1. Considering the outputs of the focus group discussion, contents in form of technical guides and webinars will have to be developed as next action on this task.

Table 2. Next training contents to be developed

Component	Type	Partner
Real-Time Locating System	GitHub README - PDF Guide	ED
Material Flow	GitHub README - PDF Guide	ED
Apache Superset App	GitHub README - PDF Guide	ED
Logistics Library	GitHub README	NCR
Person Detection & Tracking	GitHub README	AIMEN
Advanced Plant Modelling & 3D Digi	GitHub README	INESC
Pose Recognition & Correction	GitHub README	GESTALT
Business Process Optimization	GitHub README	CUT
Material Flow	Webinar	ED
Fatigue Monitoring System	Webinar	SUPSI
Intervention Manager	Webinar	SUPSI
Sensing Layer App	Webinar	HOL
Pose Recognition and Correction	Webinar	GESTALT
Business Process Optimization	Webinar	CUT
Apache Superset App	Webinar	ED
AGV	Webinar	Fraunhofer
OCB (Orion Context Broker)	Webinar	VTT
ROS integration	Webinar	CUT
IoT connections	Webinar	Depends on APPS
Marketing	Webinar	MWC

3 Conceptualization VR Lab

Title: Defining GLUON Lab Challenge and SME partners
Date: 02-2022
Location: Zoom
Participants: GLUON - MWCapital
Report:

Based on the analysis of questionnaires taken from the KTEs and the subsequent focus group meeting, the mission of the Lab has been defined.

In July 2022 (4/7-8/7), GLUON organised a week-long workshop in which Belgian teenagers developed prototypes of innovative Augmented Reality (AR) solutions for the SME Delmac Scales (partner in the KTE DSBSF). Teenagers developed **AR tools such as trainings, visualisation tools for safety measures, solutions in the interest of well-being at work and more.** For this, they were guided by **the artist duo Studio Above & Below (EN) and IT experts of Sizing Servers Lab Howest (BE), in the Open MediaLab Erasmushogeschool Brussel.**

The AR tool being used during the Lab was **Vuforia,** a comprehensive, scalable enterprise AR platform. It provides fast, easy and advanced AR content development solutions to help industrial enterprise customers address workforce challenges and meet business goals.

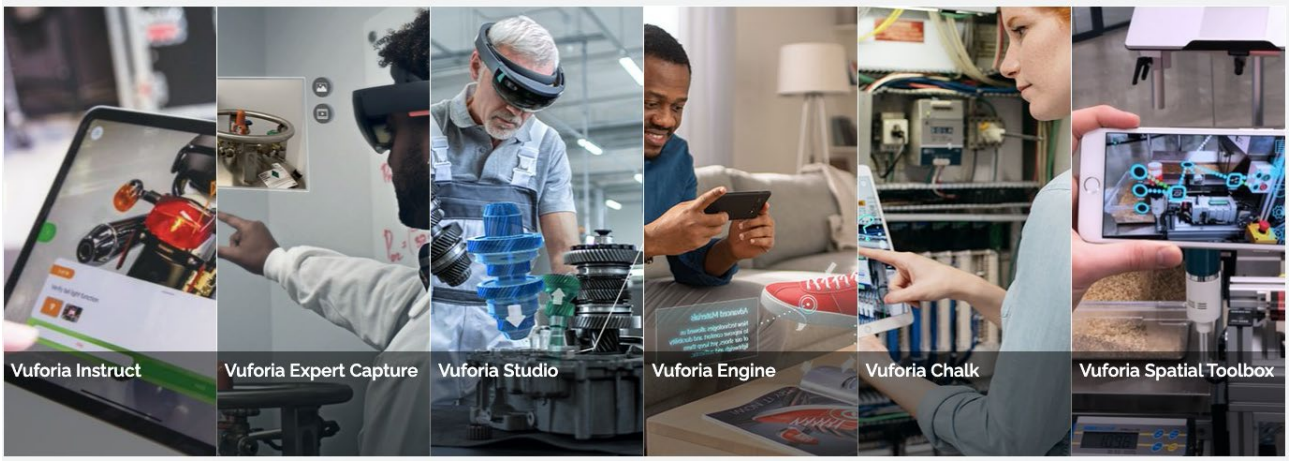


Figure 15. Vuforia tools

In the preparation phase the KTE GLUON invited the SMEs to take part in the experiment, pointing at the particular benefit they were to derive from it, were offered innovative tools and improvement of the visibility of their business.

The role of the KTE is defined below:

- **Step 1, in preparation of the Lab:** What are the needs of your company? - Zoom call (1 hour)
- **Step 2, in preparation of the Lab:** Sharing the necessary tools for teenagers to develop AR solutions for your company (e.g.: 3D scan of a robot, safety measures, a map of your company, ...) - Online Platform
- **Step 3, during the Lab:** a representative of your company takes part in a call with the youngsters during the start of the project on the 4th of July to present the SME and launch the challenge. - Zoom call (max 30')
- **Step 4, during the Lab:** a representative of your company takes part in a call with the youngsters at the end of the project on the 8th of July to see the presentation of realised projects - Zoom call (max 1h)
- **Step 5, during the Lab Exhibitions:** as a partner in this experiment the visibility of your enterprise will be improved on Social Media, during the prototype exhibition at Brussels festival I Love Science, and more - 0 min

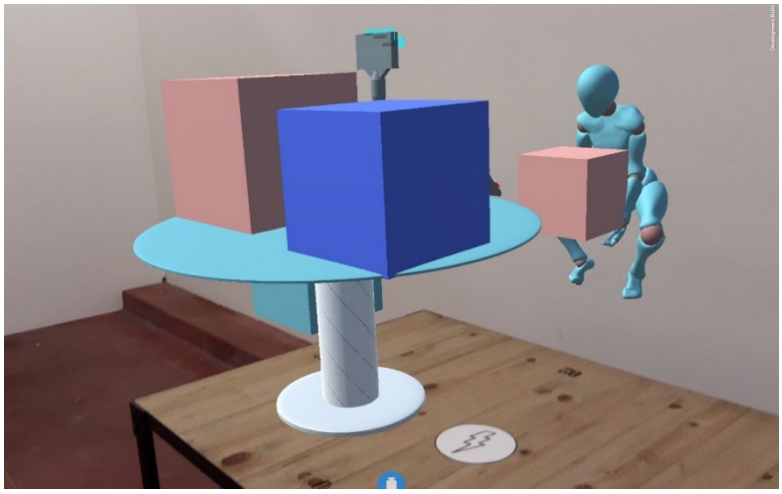
3.1 GLUON VR Lab

Title: VR Lab Better Factory I
Date: 04-08/07/2022
Time: 5 days
Location: Open MediaLab Erasmushogeschool Brussel
Partners: GLUON - Open MediaLab of Erasmushogeschool Brussel - Sizing Servers Lab (HoWest) - Studio Above&Below - Delmac Scales
Report:

This Lab was aimed at young people who like to be creative with digital tools and are interested in Virtual Reality. During VR Lab Better Factory I, 9 young people came up with AR solutions for the Greek company Delmac Scales (KTE DSBSF) and the Sizing Servers Lab (HoWest). The Lab took place in the Open MediaLab of Erasmushogeschool Brussel, under the guidance of the British artist duo Studio Above&Below and IT experts of GLUON. Youngsters developed an AR-manual for different Delmac scales and for a robot of the Sizing Servers Lab. The results are explained below.

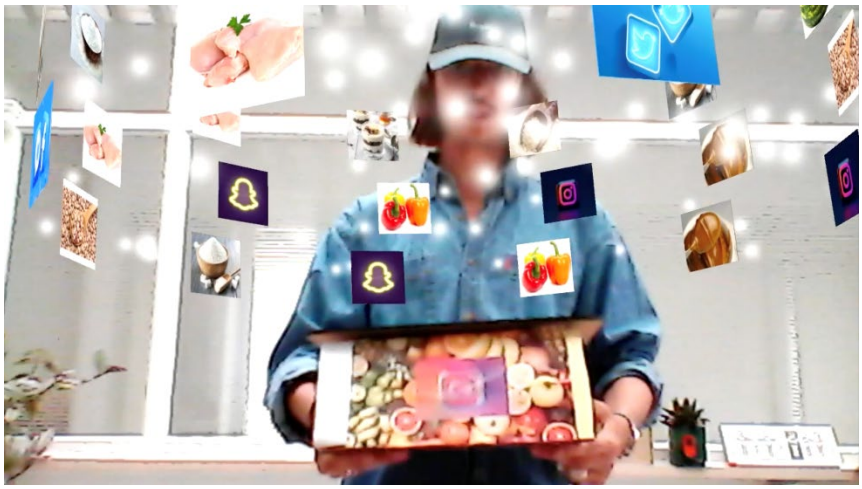
Avatar B203

Two participants designed a manual where language is not a barrier. They did this for the DS302D12 scales of the Delmac company. By means of projections, the avatar B203 informs about the danger of liquids on the scale, switching the scale on and off, the maximum weight, the correct voltage, and more.



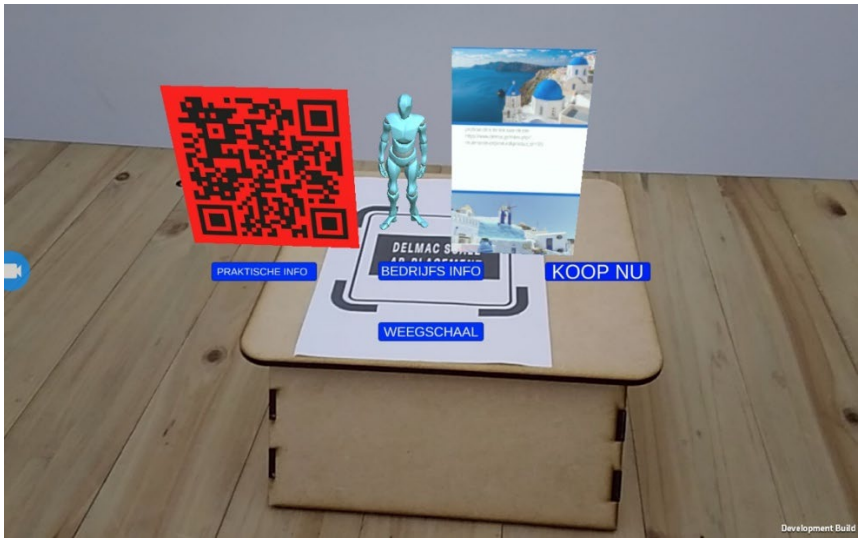
Balanza 2.5

Two other participants developed an AR manual and promo point for the Scale 2.5 that is of interest to both individuals and small businesses. With an AR application on the scale, you get a demo on how to use the scale correctly and scroll through Insta videos with customer reviews.



Delmac Scale AR Manual & Promo

The developed avatar playfully provides information about the DS202D scale from the company Delmac. By pressing the augmented buttons, you get explanations about the company and about the scale (size, battery life, maximum weight); by pressing the 'Buy me' button, you are redirected to the website.

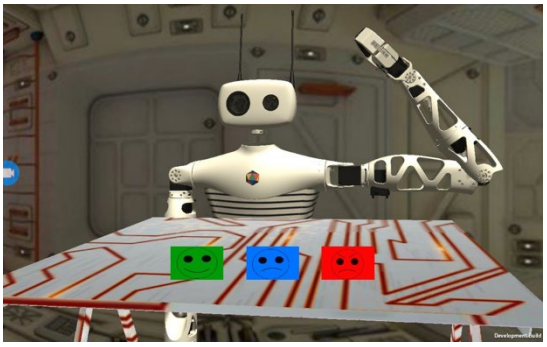


DENEFES JNR Scale project

With the Detecting Project, good use of the scales is assured! One participant developed 2 avatars that provide additional information about Delmac's scales. Avatar ToxicStop warns of the dangers of using the scales incorrectly while avatar Goody provides general information for proper use! Both avatars are activated when a drawing -which will be printed on the scales- is detected.

Reachy Feelings

Two participants developed an application for the robot Reachy at the Sizing Servers Lab. Empathy and expression of emotions play a primary role in the integration of robots into our daily lives. To give the customer an idea to what extent robot Reachy is 'humane', they added 3 virtual buttons for the basic emotions 'happy', 'angry' and 'sad'. The robot expresses its emotions by moving its antennae and by changing the colour of its eyes.



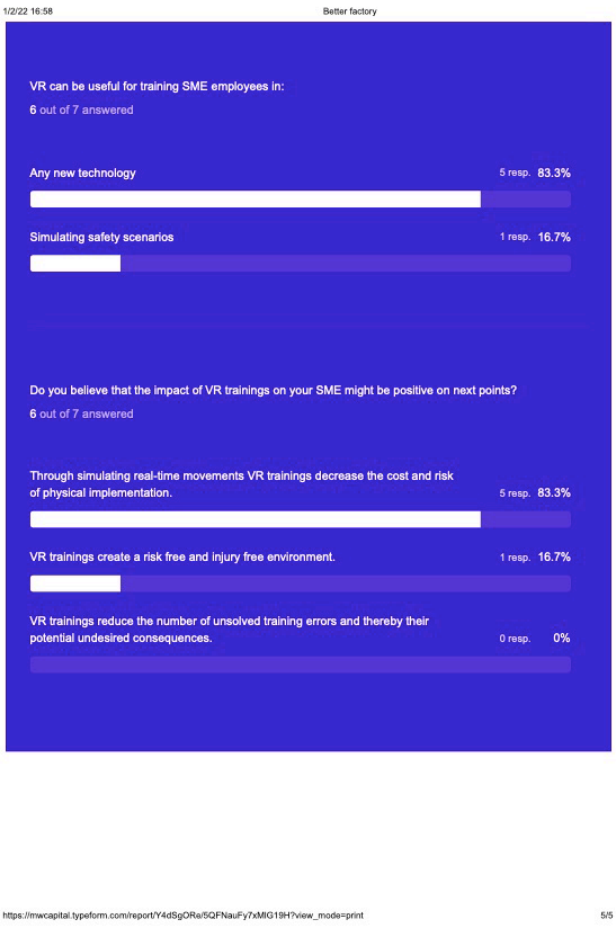
4 Conclusion

This document has presented the developed courses and training materials for KTE members, the SMEs and KTEs needs in regard to the trainings, APPS, RAMP Platform and VR Lab -based on a questionnaire and an interactive Focus Group Discussion-, and the conceptualization of a VR Lab in which youngsters and students prototype VR and AR solutions for SMEs. During the next months, MWCapital together with the partners involved in the task will further improve the developed courses and training materials, develop new courses and trainings, and conceptualize a second VR Lab for youngster. The seven SMEs selected during the Jury Day that took place in January 2023 will be contacted to take part in these training activities.

APPENDIX I. Glossary

AGVs	Automated Guided Vehicles
AGCs	Automated Guided Carts
API	Application Programming Interface
APM	Advanced Plant Modelling
APPS	Open and Standardized Advance Production Planning and Scheduling
AR	Augmented Reality
Cognitive HRI	Cognitive Human–Robot Interaction
DB setup	Database setup
DIH2 project	A Pan-European Network of Robotics Digital Innovation Hubs for Agile Production
GA	Grant Agreement
IoT	Internet of Things
IT	Information Technology
KPI	Key Performance Indicators
KTE	Knowledge Transfer Experiments
L4MS	Logistics for Manufacturing SMEs
MPMS	Monitoring Project Management System
OPIL	Optimization Logistics Library
RAMP	Robotics Automation Marketplace
ROS	Robot Operating System
SME	Small and medium-sized enterprises
VR	Virtual Reality
QA round	Question Answer round

APPENDIX II. Results Questionnaires


1/2/22 16:58
Better factory
VR can be useful for training SME employees in:
6 out of 7 answered
Any new technology
5 resp. 83.3%
Simulating safety scenarios
1 resp. 16.7%
Do you believe that the impact of VR trainings on your SME might be positive on next points?
6 out of 7 answered
Through simulating real-time movements VR trainings decrease the cost and risk of physical implementation.
5 resp. 83.3%
VR trainings create a risk free and injury free environment.
1 resp. 16.7%
VR trainings reduce the number of unsolved training errors and thereby their potential undesired consequences.
0 resp. 0%
https://mwcapital.typeform.com/report/Y4dSgORe/5QFNauFy7xMIG19H?view_mode=print
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H2020 Innovation Action – This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 951813.